

PTO/SB/21 (03-03)

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**TRANSMITTAL  
FORM**

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<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	<b>Application Number</b>	10/656,342	
	<b>Filing Date</b>	4 September 2003	
	<b>First Named Inventor</b>	Lester F. Ludwig	
	<b>Art Unit</b>	Unknown	
	<b>Examiner Name</b>	Unknown	
<b>Total Number of Pages in This Submission</b>		<b>Attorney Docket Number</b>	2738-013

**ENCLOSURES (check all that apply)**

<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s)	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <b>1. PTO/SB/O8A ((5 pages)</b> <b>2. Sixty-one (61) References and (1) translation</b> <b>3. Return Postcard</b>
<b>Remarks</b>		

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

<b>Firm or Individual name</b>	THE MAXHAM FIRM Jeffrey J. Lotspeich, Reg. No. 45,737
<b>Signature</b>	
<b>Date</b>	12 December 2003

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date: 12 December 2003			
<b>Typed or printed name</b>	Jeffrey J. Lotspeich, Reg. No. 45,737		
<b>Signature</b>		<b>Date</b>	12 December 2003

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"PATENT"

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
)  
LESTER F. LUDWIG )  
) Group No: UNKNOWN  
SERIAL NO.: 10/656,342 )  
) Examiner: UNKNOWN  
FILED: September 4, 2003 )  
)  
FOR: NON-POSITIVE-DEFINITE OPTICAL )  
FILTERING FROM POSITIVE-DEFINITE )  
TRANSFER FUNCTIONS )

Commissioner for Patents  
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INFORMATION DISCLOSURE STATEMENT

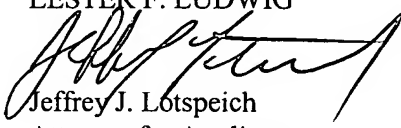
Applicant hereby cites the documents listed in accompanying Form PTO/SB/08A with respect to the above-referenced patent application under the provisions of 37 CFR, §§ 1.56, 1.97 and 1.98. Since the above-referenced patent application was filed after June 30, 2003, Applicant is not submitting copies of the cited U.S. patent documents. However, copies of non-U.S. patent documents are enclosed.

The filing of this Information Disclosure Statement will not be construed to mean that a search was conducted or that no other material information, as defined by 37 CFR 1.56, exists.

The Examiner is respectfully requested to make the listed documents of record in connection with the prosecution of the subjection application.

Respectfully submitted,

LESTER F. LUDWIG

By:   
Jeffrey J. Lotspeich  
Attorney for Applicant  
Registration No. 45,737

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PTO/SB/08B(10-01)

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)		<b>Complete if Known</b>			
		Application Number	10/656,342,		
		Filing Date	4 September 2003		
		First Named Inventor	Lester F. Ludwig		
		Group Art Unit	Unknown		
		Examiner Name	Unknown		
Sheet	5	of	5	Attorney Docket Number	2738-13

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
✓	C33	H. M. OZAKTAS, D. MENDLOVIC, "Fractional Fourier Transforms and their Optical Implementation I," Journal of the Optical Society of America, A vol. 10, No. 9, pp. 1875-1881, Sep. 1993.	
✓	C34	H. M. OZAKTAS, D. MENDLOVIC, "Fractional Fourier Transforms and their Optical Implementation II," Journal of the Optical Society of America, A vol. 10, No. 12, pp. 2522-2531, Dec. 1993.	
✓	C35	H. M. OZAKTAS, M. A. KUTAY, O. ARIKAN, L. ONURAL, "Optimal filtering in Fractional Fourier Domains," IEEE Transactions on Signal Processing, vol. 45, No. 5, pp. 1129-1143, May 1997.	
✓	C36	H. M. OZAKTAS, H. OZAKTAS, M. A. KUTAY, O. ARIKAN, M. F. ERDEN, "Solution and Cost Analysis of General Multi-channel and Multi-stage Filtering Circuits," IEEE, Piscataway, N. J., pp 481-484, Oct. 1998.	
✓	C37	H. M. OZAKTAS, H. OZAKTAS, M. A. KUTAY, O. ARIKAN, "The Fractional Fourier Domain Decomposition (FFDD)," Signal Processing, 1999. 4 pgs.	
✓	C38	A. PAPOULIS, "Systems and Transforms with Applications in Optics," Krieger, Malabar, Florida, 1986. pp. 1, 344-355, 410-421, 430-435.	
✓	C39	S. THANGAVELU, "Lectures on Hermite and Laguerre Expansions," Princeton University Press, Princeton, New Jersey, 1993. pp. 1-23, 84-91, 110-119.	
✓	C40	N. WIENER, "The Fourier Integral and Certain of Its Applications," (Dover Publications, Inc., New York, 1958) originally Cambridge University Press, Cambridge, England, 1933. pp. 46-71.	
✓	C41	"Taking the Fuzz out of Photos," Newsweek, vol. CXV, No. 2, Jan. 8, 1990.	

Examiner Signature		Date Considered	
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

Sheet 1 of 5

**Complete if Known**

Application Number	10/656,342
Filing Date	4 September 2003
First Named Inventor	Lester F. Ludwig
Group Art Unit	UNKNOWN
Examiner Name	UNKNOWN
Attorney Docket Number	2738-13

**U.S. PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code <sup>2</sup> (if known)			
	A1	US-3,519,331	07-07-1970	Cutrona et al.	
	A2	US-4,572,616	02-25-1986	Kowel et al.	
	A3	US-5,016,976	05-21-1991	Horner et al.	
	A4	US-5,061,046	10-29-1991	Lee et al.	
	A5	US-5,323,472	06-21-1994	Falk	
	A6	US-5,416,618	05-16-1995	Juday	
	A7	US-5,426,521	06-20-1995	Chen et al.	
	A8	US-5,432,336	07-11-1995	Carangelo et al.	
	A9	US-5,544,252	08-06-1996	Iwaki et al.	
	A10	US-5,706,139	01-06-1998	Kelly	
	A11	US-5,815,233	09-29-1998	Morokawa et al.	
	A12	US-5,859,728	01-12-1999	Colin et al.	
	A13	US-5,959,776	09-28-1999	Pasch	
	A14	US-6,021,005	02-01-2000	Cathey, Jr. et al.	
	A15	US-6,229,649 B1	05-08-2001	Woods et al.	
	A16	US-6,252,908 B1	06-26-2001	Tore	
	A17	US-6,404,553 B1	06-11-2002	Wootton et al.	
	A18	US-6,421,163 B1	07-16-2002	Culver et al.	
	A19	US-6,505,252 B1	01-07-2003	Nagasaka	

**FOREIGN PATENT DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)				
	B1	05-066377	03-19-1993	Amako Atsushi et al.		

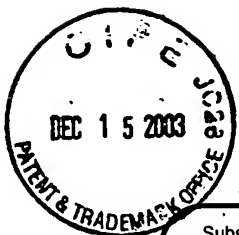
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<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet

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**Complete if Known**

Application Number	10/656,342
Filing Date	4 September 2003
First Named Inventor	Lester F. Ludwig
Group Art Unit	Unknown
Examiner Name	Unknown
Attorney Docket Number	2738-13

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials *	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
/	C1	SUMIYOSHI ABE, et al., "An optical implementation for the estimation of the fractional-Fourier order", Optics Communications 137 (May 1, 1997), 214-218.	
/	C2	N. I. ACHIESER, Theory of Approximation, Dover, New York, 1992. pp. 1-23 & 78-81.	
/	C3	JUN AMAKO, et al., "Kinoform using an electrically controlled birefringent liquid-crystal spatial light modulator", Applied Optics, vol. 30, No. 32, Nov. 10, 1991, pp. 4622-4628.	
/	C4	V. BARGMANN, "On a Hilbert Space of Analytical Functions and an Associated Integral Transform," Comm. Pure Appl. Math, vol. 14, 1961, 187-214.	
/	C5	L. M. BERNARDO, O. D. D. Soares, "Fractional Fourier Transforms and Imaging," Journal of Optical Society of America, vol. 11, No. 10, Oct. 1994, pp. 2622-2625.	
/	C6	PHILIP M. BIRCH, et al., "Real-time optical aberration correction with a ferroelectric liquid-crystal spatial light modulator", Applied Optics, vol. 37, No. 11, Apr. 10, 1998, pp. 2164-2169.	
/	C7	Y. BITRAN, H. M. OZAKTAS, D. MENDLOVIC, R.G.DORSCH, A. W. LOHMANN, "Fractional Fourier Transform: Simulations and Experimental Results," Applied Optics vol. 34 No. 8, Mar. 1995. pp. 1329-1332.	
/	C8	E.U. CONDON, "Immersion of the Fourier Transform in a Continuous Group of Functional Transforms," in Proceedings of the National Academy of Science, vol. 23, pp. 158-161, 1937.	
/	C9	P. J. DAVIS, Interpolation and Approximation, Dover, New York, 1975. pp. 24-55, 106-185, 328-340.	
/	C10	B. W. DICKINSON AND D. STEIGLITZ, "Eigenvectors and Functions of the Discrete Fourier Transform," in IEEE Transactions on Acoustics, Speech, and Signal Processing, vol. ASSP-30, No. 1, Feb. 1982.	
/	C11	R. DORSCH, "Fractional Fourier Transformer of Variable Order Based on a Modular Lens System," in Applied Optics, vol. 34, No. 26, pp. 6016-6020, Sep. 1995.	

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/	C12	M. FATIH ERDEN, et al., "Design of dynamically adjustable anamorphic fractional Fourier transformer", Optics Communications 136 (Mar. 1, 1996), pp. 52-60.	
/	C13	M. F. ERDEN, "Repeated Filtering in Consecutive Fractional Fourier Domains," doctoral dissertation at Bilkent Univ., Aug. 18, 1997.	
/	C14	G. B. FOLLAND, Harmonic Analysis in Phase Space, Princeton University Press, Princeton, NJ, 1989. pp. 51-55, 223-224, 236-239, 193.	
/	C15	J. W. GOODMAN, Introduction to Fourier Optics, McGraw-Hill, New York, 1968. pp. 77-197.	
/	C16	E. HECHT, "Grin Systems", Optics. Third Edition, Ch. 6, section 6.4, pp. 277-280, Addison-Wesley publishing, (c) 1998.	
/	C17	K. IIZUKA, Engineering Optics, Second Edition, Springer-Verlag, 1987. pp. 238-311.	
/	C18	SANG-IL JIN, et al., "Generalized Vander Lugt Correlator with fractional Fourier transforms for optical pattern recognition systems", Lasers and Electro-Optics, 1997, CLEO/Pacific Rim, Pacific Rim Conf. on. p. 311.	
/	C19	F. H. KERR, "A Distributional Approach to Namias' Fractional Fourier Transforms," in Proceedings of the Royal Society of Edinburgh, vol. 108A, pp. 133-143, 1983.	
/	C20	F. H. KERR, "On Namias' Fractional Fourier Transforms," in IMA J. of Applied Mathematics vol. 39, No. 2, pp. 159-175, 1987.	
/	C21	M. A. KUTAY, M. F. ERDEN, H.M. OZATKAS, O. ARIKAN, C. CANDAN, O. GULERYUZ, "Cost-effective Approx. of Linear Systems with Repeated and Multi-channel Filtering Configurations," IEEE pp 3433-3436, May 12, 1998.	

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Sheet

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Group Art Unit	Unknown
Examiner Name	Unknown
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	C22	M. A. KUTAY, "Generalized Filtering Configurations with Applications in Digital and Optical Signal and Image Processing," doctoral dissertation at Bilkent Univ. Feb. 24, 1999.	
	C23	M. A. KUTAY, M. F. ERDEN, H. M. OZATKAS, O. ARIKAN, C. CANDAN, O. GULERYUZ, "Space-bandwidth-efficient Realizations of Linear Systems," Optics Letters, vol. 23 No. 14, Jul. 15, 1998. pp. 1069-1071.	
	C24	N. N. LEBEDEV, Special Functions and their Applications, Dover, New York, 1965. pp. 60-77.	
	C25	L. LEVI, Applied Optics, vol. 2 (Sec. 19.2), Wiley, New York, 1980.	
	C26	ADOLF W. LOHMANN, "A fake zoom lens for fractional Fourier experiments", Optics Communications 115 (Apr. 1, 1995) 437-443.	
	C27	L. F. LUDWIG, "General Thin-Lens Action on Spatial Intensity (Amplitude) Distribution Behaves as Non-Integer Powers of Fourier Transform," Spatial Light Modulators and Applications Conference, South Lake Tahoe, 1988.	
	C28	M. E. MARHIC, "Roots of the Identity Operator and Optics," Journal of Optical Society of America, vol. 12, No. 7, Jul. 1995. pp. 1448-1459.	
	C29	V. NAMIAS, "The Fractional Order Fourier Transform and its Application to Quantum Mechanics," in J. of Institute of Mathematics and Applications, vol. 25, pp. 241-265, 1980.	
	C30	H. M. OZAKAS, "Digital Computation of the Fractional Fourier Transform," IEEE Transactions on Signal Processing, Vol. 44, No. 9, pp. 2141-2150, September 1996.	
	C31	H. M. OZAKTAS, D. MENDLOVIC, "Every Fourier Optical System is Equivalent to Consecutive Fractional-Fourier-domain Filtering," Applied Optics, vol. 35, No. 17, Jun. 1996. pp. 3167-3170.	
	C32	H. M. OZAKTAS, D. MENDLOVIC, "Fourier Transforms of Fractional Order and their Optical Interpretation," Optics Communications, vol. 101, No. 3, 4 pp. 163-169.	

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